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(54) **REDUCED LAYER KEYBOARD STACK-UP**

(71) Applicant: **APPLE INC.**, Cupertino, CA (US)

(72) Inventors: **Robert Y. Cao**, Cupertino, CA (US); **Dinesh C. Mathew**, Cupertino, CA (US)

(73) Assignee: **APPLE INC.**, Cupertino, CA (US)

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See application file for complete search history.

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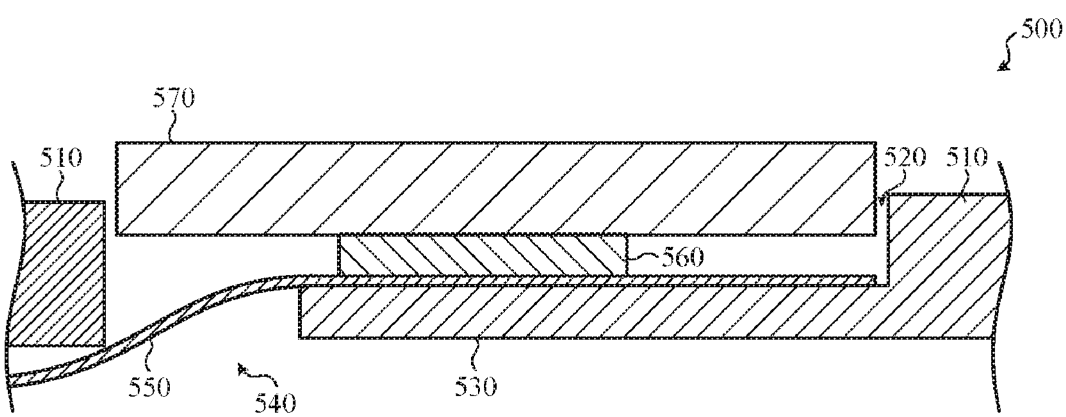
Primary Examiner — Vanessa Girardi

(74) *Attorney, Agent, or Firm* — Brownstein Hyatt Farber Schreck, LLP

(57) **ABSTRACT**

Disclosed herein is a stack-up for an input device. The stack-up may include a flexible substrate having a switch and a light source. The switch has at least two contacts that are bridged in response to actuation of a dome that is positioned above the switch. The flexible substrate includes a signal trace for detecting the actuation of the dome and a power trace for providing power to the light source.

19 Claims, 5 Drawing Sheets



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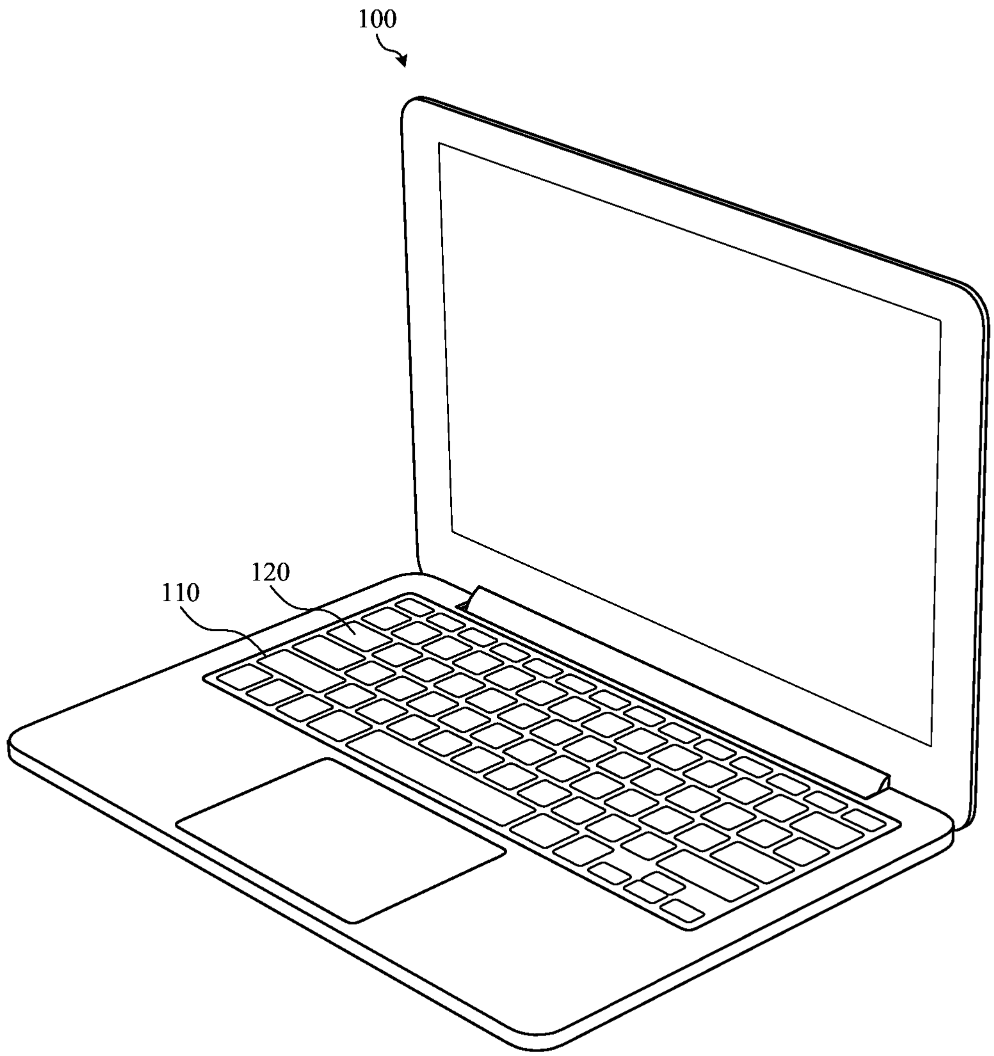

FIG. 1

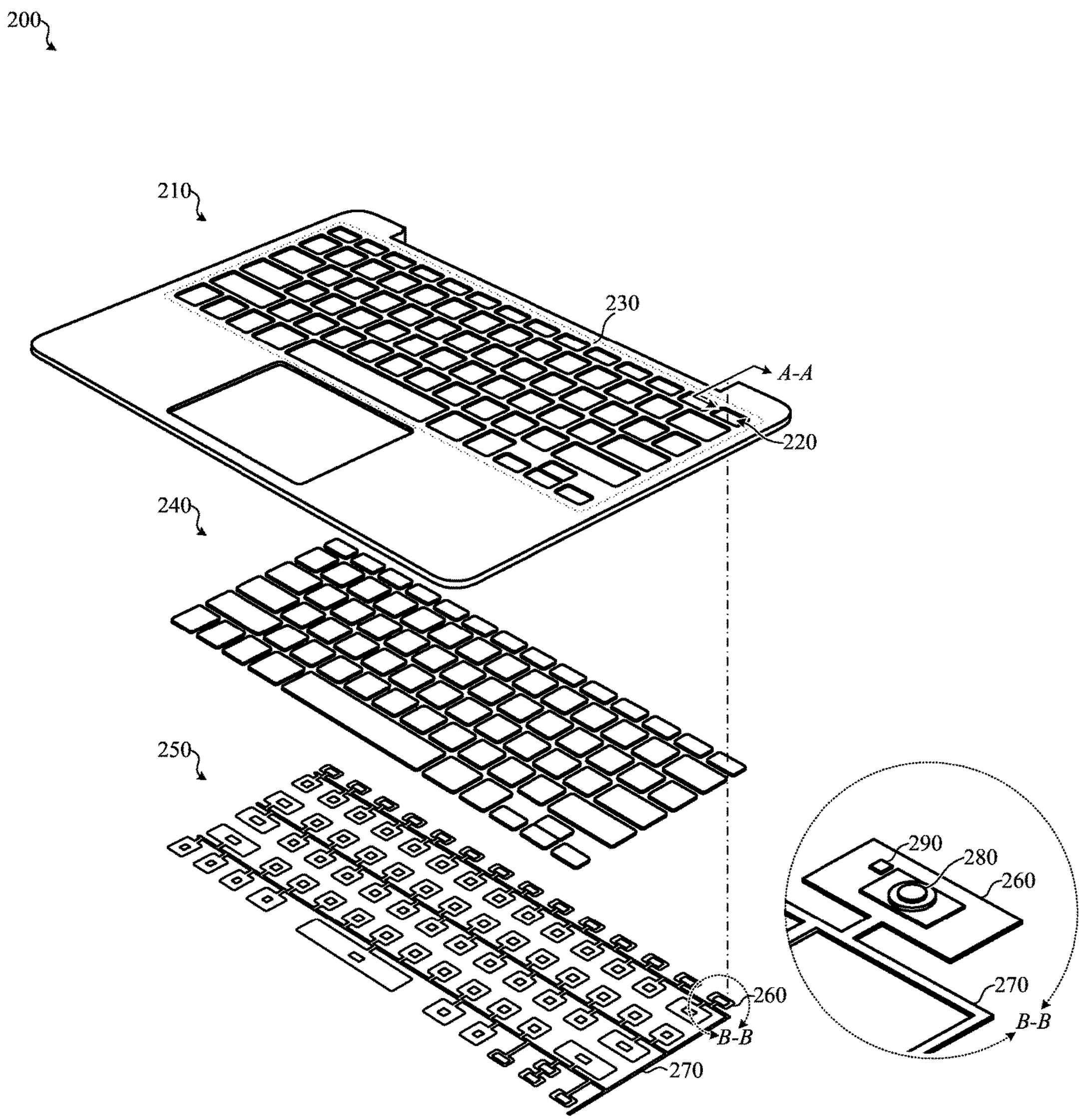

FIG. 2

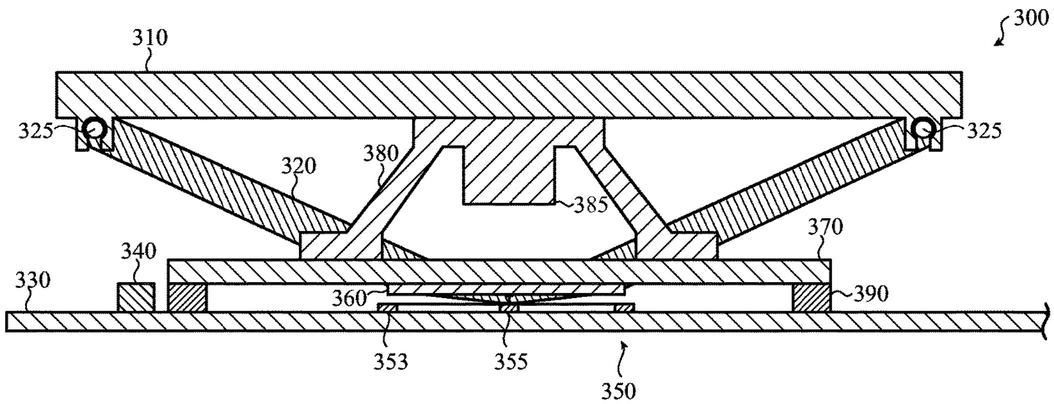
300
310
325
325
320
380
385
370
340
330
360
390
353
355
350

FIG. 3A

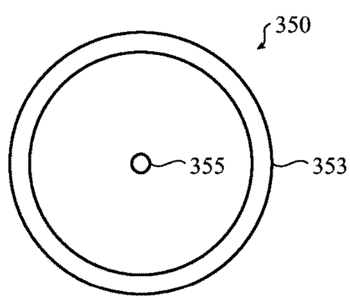
350
355
353

FIG. 3B

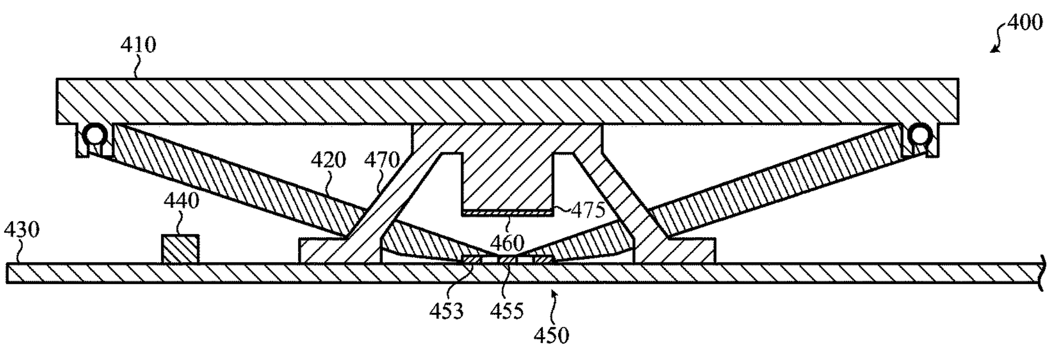

FIG. 4

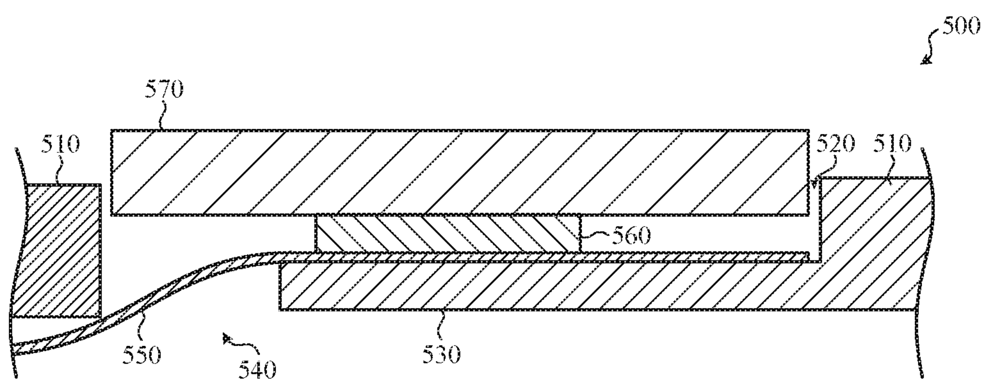

FIG. 5

REDUCED LAYER KEYBOARD STACK-UP

FIELD

The described embodiments relate generally to an assembly for an input device. More particularly, the present embodiments relate to a keyboard stack-up for a keyboard assembly.

BACKGROUND

Electronic devices typically include one or more input devices such as keyboards, touchpads, mice, or touchscreens to enable a user to interact with the device. These input devices can be integrated into an electronic device or can stand alone as discrete devices that transmit signals to the electronic device via a wired or wireless connection.

A conventional keyboard typically includes a dome switch, two layers (typically plastic) separated by a spacer and a contact switch coupled to a printed circuit board. Upon actuation of the dome, the first layer deflects and comes into contact with the second layer. As the layers contact one another, the switch closes and ultimately provides a detectable input. However, as more layers are included in the keyboard assembly, the overall thickness of the keyboard assembly increases. When a keyboard or other input device is integrated with an electronic device, particularly small or thin form factor electronic devices, the increased thickness of the keyboard assembly or input device may be undesirable.

SUMMARY

Generally, embodiments disclosed herein are directed to an input assembly. The input assembly includes a top case defining a keyhole. The keyhole has a support structure that extends from a base of the opening to form a ledge or platform. The input assembly also includes a stack-up positioned on the support structure. The stack-up includes a substrate, an in-plane switch coupled to the substrate, and a dome positioned above the in-plane switch. The dome is adapted to cause the in-plane switch to conduct a signal in response to actuation of the dome.

Also disclosed is a stack-up for an input device. The stack-up includes a substrate. In some embodiments, the substrate may be flexible. A switch having at least two contacts is coupled to the substrate. An optional light source may also be coupled to the substrate. The stack-up also includes a dome positioned above the switch. Actuation of the dome causes a conductive material positioned above the switch to bridge the at least two contacts of the switch. The substrate contains a signal trace for detecting the actuation of the dome. When the light source is present, the substrate also includes a power trace for providing power to the light source.

In yet another embodiment, a stack-up for an input device may include a flexible substrate having a signal trace formed thereon. The stack-up also includes a switch having at least two contacts and a dome positioned above the switch. A conductive material may be integrated with a bottom surface of the dome. The conductive material of the dome bridges the at least two contacts of the switch in response to actuation of the dome.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure will be readily understood by the following detailed description in conjunction with the accompa-

nying drawings, wherein like reference numerals designate like structural elements, and in which:

FIG. **1** illustrates an example electronic device that may use the keyboard assembly and keyboard stack-up described herein according to one or more embodiments of the present disclosure;

FIG. **2** illustrates an example keyboard assembly according to one or more embodiments of the present disclosure;

FIG. **3**A illustrates an example reduced layer keyboard stack-up including a keycap and a hinge mechanism according to one or more embodiments of the present disclosure;

FIG. **3**B illustrate a top-down view of an example in-plane switch according to one or more embodiments of the present disclosure;

FIG. **4** illustrates an example reduced layer keyboard stack-up including a keycap and a hinge mechanism according to one or more alternate embodiments of the present disclosure; and

FIG. **5** illustrates a cross-section view of an example keyboard assembly according to one or more embodiments of the present disclosure.

DETAILED DESCRIPTION

Reference will now be made in detail to representative embodiments illustrated in the accompanying drawings. It should be understood that the following descriptions are not intended to limit the embodiments to one preferred embodiment. To the contrary, it is intended to cover alternatives, modifications, and equivalents as can be included within the spirit and scope of the described embodiments as defined by the appended claims.

The following disclosure relates generally to various layers of components that form a keyboard assembly or an input assembly for an input device. The layers of the components are referred to herein as a "stack-up." More specifically, the disclosure is directed to a reduced layer keyboard stack-up for a keyboard assembly or other input assembly of an electronic device. The stack-up may be reduced in size and some components or layers of the stack-up may be removed to reduce the overall size, dimension and/or thickness of the keyboard or input device.

Conventional keyboard stack-ups often include at least three discrete layers with each layer having a different thickness. More specifically, conventional keyboard stack-ups include a switch mounted on a polyethylene terephthalate (PET) membrane, a backlight layer that includes one or more light sources and one or more light guides, and a structural layer typically made of a stainless steel sheet metal. As the PET membrane deflects, electrical traces associated with the switch contact each other for an electrical make.

In contrast, the keyboard stack-up of the present disclosure uses a flexible substrate (such as a flex circuit) as the bottom layer for the switch. As such, one or more light sources may be coupled to the flexible substrate such that they are on the same layer as the switch. More specifically, the keyboard stack-up of the present disclosure utilizes an in-plane switch that enables the keyboard stack-up to have fewer layers, thereby reducing the overall thickness of the keyboard stack-up and any associated keyboard. Because the keyboard stack-up utilizes a flexible substrate, the keyboard stack-up, or an associated keyboard, may be manipulated, bent, or otherwise deflected, at least at particular points or portions. The reduced profile and the ability of the keyboard stack-up to be manipulated in such a manner may enable a keyboard assembly, and more particularly a top case of a keyboard assembly, to have additional support structures and/or increased thickness without increasing or unduly increasing the overall thickness of the keyboard and/or the electronic device. As such, the keyboard assembly may be used with electronic devices having a small form factor and/or a thin profile.

The reduced layer keyboard stack-up includes a flexible substrate, a dome, an in-plane switch and an optional light source. The in-plane switch and the light source are coupled to the flexible substrate. In some embodiments, the flexible substrate may also be laminated or coupled to a printed circuit board or other stiffener.

The in-plane switch includes two or more contacts that are bridged in response to contact from a conductive material. More specifically, as the dome is actuated, collapses or is otherwise compressed, a conductive material, either on a deflection layer of the stack-up or on the dome is brought into contact with the two or more contacts of the in-plane switch to conduct a signal. The signal may be transmitted along a signal trace that is embedded in or otherwise provided on the flexible substrate. In addition, a power trace may also be provided in or on the flexible substrate to provide power to the light source.

These and other embodiments are discussed below with reference to FIGS. **1**-**5**. However, those skilled in the art will readily appreciate that the detailed description given herein with respect to these Figures is for explanatory purposes only and should not be construed as limiting.

FIG. **1** illustrates an example electronic device **100** that may use the keyboard assembly and keyboard stack-up described above and herein. In a non-limiting example, the electronic device **100** may be a laptop computer having an integrated keyboard **110**. The keyboard **110** may include various keys **120**. The keys **120** may each be associated with a respective keyboard stack-up such as described herein. Further, each key **120** may be supported by a support structure of a top case such as described below.

While a laptop computer is specifically shown and described, the electronic device **100** may be configured as any electronic device that may utilize the keyboard assembly and/or the keyboard stack-up described herein. For example, the electronic device **100** may be a desktop computer, a tablet computing device, a smartphone, a gaming device, a display, a digital music player, a wearable computing device or display, a health monitoring device, and so on. In addition, while a keyboard is specifically mentioned, the embodiments described herein may be used in a variety of input devices such as, buttons, switches and so on.

FIG. **2** illustrates an exploded view of an example keyboard assembly **200** according to one or more embodiments of the present disclosure. The keyboard assembly **200** may be used with an electronic device, such as, for example, a laptop computer shown in FIG. **1** or other such electronic device.

The keyboard assembly **200** includes a top case **210**. The top case **210** may take the form of an exterior protective casing or shell for the electronic device. The top case **210** may also protect the various internal components of the electronic device including a keyboard stack-up array **250**.

Top case **210** may be formed as a single, integral component. The top case **210** may be coupled to a bottom case which is not shown for clarity. The top case **210** may have a group of distinct components that may be configured to be coupled to one another. In non-limiting examples, top case **210** may be made from metal, a ceramic, a rigid plastic or another polymer, a fiber-matrix composite, and so on.

The top case **210** may define or otherwise include one or more openings or keyholes **220**. The keyholes **220** may be configured to receive keycaps **240** that are associated with each key of a keyboard. The keycaps **240** may partially protrude or otherwise extend from the top case **210** through the keyholes **220**. In addition, each keycap **240** may be at least partially surrounded by a portion of the top case **210**. Stated another way, the keyholes **220** that are formed in the top case **210** cause ribs **230** to be formed in the top case **210**. The ribs **230** are positioned between the keycaps **240** to divide and separate each key of the keyboard. The ribs **230** may provide structural support for the top case **210**.

The keyboard assembly **200** also includes a keyboard stack-up array **250**. The keyboard stack-up array **250** includes multiple keyboard stack-ups **260** (shown in detail in B-B) secured within or otherwise coupled to a frame **270**. In some implementations, the frame **270**, or portions of the frame **270** may be flexible or bendable. For example, different portions of the frame **270** may be coupled to individual keyboard stack-ups **260**. As such, the frame **270** may enable each individual keyboard stack-up **260** to move independently of one another. Thus, each keyboard stack-up **260** may be inserted into respective keyholes **220** and supported by a support structure of the top case **210**.

Each keyboard stack-up **260** in the keyboard stack-up array **250** may be similar to the keyboard stack-up described below. That is, each keyboard stack-up **260** may include a substrate, an in-plane switch (not shown) a dome **280** positioned over the in-plane switch, a light source **290**, a signal trace and a power trace.

The frame **270** may have similar pattern or structure as the ribs **230** of the top case **210**. Accordingly, the frame **270** may provide added structural support for the top case **210**. The frame **270** may have various signal traces and/or power traces formed thereon for each light source **290** and in-plane switch coupled to respective keyboard stack-ups **260**.

In alternative embodiments, the keyboard assembly **200** may be used to create a flexible keyboard. In such embodiments, the top case **210** may be omitted or may be formed from a flexible material. The flexible material, and more specifically the flexible keyboard, may have a maximum bend radius such that components (e.g., traces, switches and so on) of the keyboard assembly are not damaged. In other implementations, each component of the keyboard stack-up **260** may be placed or otherwise coupled to a flex.

FIG. **3**A illustrates an example reduced layer keyboard stack-up **300** including a keycap **310** and a hinge mechanism **320** according to one or more embodiments of the present disclosure. The keycap **310** may be coupled to the hinge mechanism **320** using one or more retaining features **325**. The hinge mechanism **320** enables the keycap **310** to move from an uncompressed state to a compressed state and vice versa. Example hinge mechanisms **320** include, but are not limited to, a butterfly hinge mechanism, a scissor hinge mechanism, a telescoping hinge mechanism, a sliding hinge mechanism and so on. The hinge mechanism **320** may also be coupled to a substrate **330** of the keyboard stack-up **300**.

The substrate **330** of the keyboard stack-up **300** may be flexible. In other implementations, the substrate **330** may be a printed circuit board. The various layers (including additional plastic or deflection layers not shown in the figures) of the keyboard stack-up **300** may be laminated or otherwise coupled to a printed circuit board or a flex. Further, some of the connections or traces may be provided on or otherwise formed on the printed circuit board and/or the flex and provided to the components of the keyboard stack-up **300**.

Multiple keyboard stack-ups **300** may be coupled together to form a keyboard stack-up array, such as, for example, keyboard stack-up array **250** (FIG. **2**). Accordingly, each key of a keyboard may have a discrete keyboard stack-up **300**. As such, each key of a keyboard may have its own keycap **310**, hinge mechanism **320**, light source **340** and so on. Accordingly, each key of the keyboard may be illuminated by its own light source **340** and the illumination of each key may be separately tuned or otherwise adjusted.

Each keyboard stack-up **300** in the array may be inserted into or otherwise coupled to a top case of a keyboard assembly such as described herein. More specifically, a top case of the keyboard assembly may include a ledge or other support structure that is adapted to receive and support an individual keyboard stack-up **300** or multiple keyboard stack-ups **300**.

The keyboard stack-up **300** may also include a stiffener. The stiffener may provide additional structural support for the keyboard stack-up **300**. The stiffener may be aluminum, stainless steel, plastic or other such material. Stiffeners of varying thicknesses may be used depending on the stiffness of the substrate **330** and/or the desired stiffness of the keyboard stack-up **300**. In other implementations, the stiffener may be omitted.

In embodiments where the substrate **330** is a printed circuit board, a stiffener may not be required. Optionally, where the substrate **330** is a flexible substrate (such as a flex circuit), a stiffener may be coupled to the flexible substrate to provide additional structural support for the keyboard stack-up **300** and/or a top case of the electronic device in which the keyboard stack-up **300** is placed. In some embodiments, the flexible substrate or other such flexible material may be coupled to a printed circuit board.

The keyboard stack-up **300** may also include a light source **340**. The light source **340** may be coupled to an optional light guide to illuminate the keycap **310**. The keycap **310** may also include a glyph on an exposed surface. The glyph may be transparent or substantially transparent to enable light from the light source **340** to pass through the glyph and illuminate the keycap **310**. In some implementations, the keycap **310** may be substantially opaque while the glyph is transparent or substantially transparent. In some implementations, the perimeter of the keycap **310** may also be illuminated. The light source **340** is coupled to the substrate **330** and receives power from a power trace that is printed, formed or otherwise disposed in or on the substrate **330**. In some embodiments, the light source **340** is a light-emitting diode although other light sources may be used.

The keyboard stack-up **300** also includes an in-plane switch **350**. Although an in-plane switch **350** is specifically mentioned, various switches may be used. The in-plane switch **350** may be coupled to the substrate **330**. In some implementations, the base of the in-plane switch **350** may be the substrate **330**. For example, and as previously explained, the substrate **330** may be a flexible substrate or a flex and the flexible substrate or the flex is the base of the in-plane switch **350**.

The contacts (e.g., outer contact **353** and inner contact **355**) of the in-plane switch **350** may be planar or substantially planar with respect to a surface of the substrate **330**. In other implementations, the contacts of the in-plane switch **350** may protrude or extend from the substrate **330**. In yet other implementations, the contacts may be recessed with respect to the substrate **330**.

The in-plane switch **350** may include two (or more) contacts. Specifically, the in-plane switch **350** may have an outer contact **353** and an inner contact **355**. As shown in FIG. **3**B, which is a top-down view of the in-plane switch **350**, the outer contact **353** and the inner contact **355** may be concentric. That is, the inner contact **355** may be surrounded by the outer contact **353**.

In some implementations a trace may connect the inner contact **355** with the outer contact **353**. Thus, contact by a conductive material on either the inner contact **355** or the outer contact **353** may cause the in-plane switch **350** to conduct a signal. In other implementations, each of the inner contact **355** and outer contact **353** may have separate traces. In such an implementation, a signal is conducted when a conductive material contacts both the inner contact **355** and the outer contact **353**. Because the traces are in-plane with the contacts or may otherwise be formed in or on the substrate **330**, the outer contact **353** may have a gap that allows the trace of the inner contact **355** to connect with the inner contact **355** but not the outer contact **353**.

Referring back to FIG. **3**A, when a conductive material **360**, such as, for example a silver pad, contacts the inner contact **355** and/or the outer contact **353** (depending on the implementations described above) of the in-plane switch **350** though actuation of the keycap **310** and/or collapse of the dome **380**, the conductive material **360** bridges the contacts to create an electrical connection. The electrical connection generates a signal indicative of the received input. In other implementations, the conductive material **360** may short a connection or otherwise draw power down between the inner contact **355** and the outer contact **353** thereby generating a signal indicative of received input.

Although a silver pad is specifically mentioned in the example above, other conductive materials may be used. In addition, once the signal is generated, it may be transmitted on a signal trace formed on, integrated with or otherwise printed on the substrate **330**.

The keyboard stack-up **300** also includes a dome **380** coupled to a deflection layer **370** and positioned over the in-plane switch **350**. The dome **380** and the deflection layer **370** may also be placed over the light source **340**. As such, one or both of the dome **380** and the deflection layer **370** may be transparent or at least partially transparent and may act as a light guide such that light may pass though and illuminate the keycap **310**.

The deflection layer **370** may include a conductive material positioned in and/or on a bottom surface. The deflection layer **370** may be thermoplastic polymer such as, for example, polyethylene terephthalate. Although a specific example has been given, the deflection layer **370** may be made from various materials.

In some embodiments, the dome **380** is a rubber dome. In other embodiments, the dome may be a plastic dome, a metal dome or may be made from various other materials. The dome **380** is configured to collapse, be deformed or otherwise compress in response to actuation of the dome **380** and/or the keycap **310**. While a dome **380** is specifically shown and described, the dome **380** may be optional or may be replaced by a spring, a plunger on a keycap **310** and other such mechanisms that may be used to deflect or actuate the deflection layer **370** or bridge the contacts of the in-plane switch **350**.

As the dome **380** is compressed, a nub **385** or other portion of the dome **380** causes the deflection layer **370**, and more specifically, the conductive material **360** on the bottom surface of the deflection layer **370**, to deflect toward the contacts of the in-plane switch **350**. Once the conductive material **360** comes into contact with the contacts of the in-plane switch **350**, a signal indicative of which key or button of the electronic device has been actuated is generated and transmitted along the signal trace of the substrate **330** to an associated electronic device or a dedicated processing element in the keyboard. When the dome **380** returns to its nominal state, the deflection layer **370** also returns to its nominal state and the conductive material **360** is removed from the contacts of the in-plane switch **350**.

The keyboard stack-up **300** may also have one or more spacers **390** positioned between the substrate **330** and the deflection layer **370**. The spacers **390** may be used to provide separation between the conductive material **360** and the contacts of the in-plane switch **350**. In addition, the spacers **390** may assist the deflection layer **370** in returning to its nominal state.

FIG. **4** illustrates an example reduced layer keyboard stack-up **400** according to one or more alternate embodiments of the present disclosure. The reduced layer keyboard stack-up **400** is generally the same as the reduced layer keyboard stack-up **300** shown and described with respect to FIG. **3**A but without the deflection layer **370**.

As such, the reduced layer keyboard stack-up **400** includes a keycap **410**, a hinge mechanism **420**, a substrate **430**, an optional light source **440**, and an in-plane switch **450**. The light source **440** is configured to illuminate the keycap **410** while the in-plane switch **450** is configured to detect actuation of keycap **410** and/or dome **470** of the keyboard stack-up **400**. The contacts of the in-plane switch **450** may be concentric. For example, the in-plane switch **450** may have an outer contact **453** and an inner contact **455**. The substrate **430** may also include a power trace for providing power to the light source **440** and may include a signal trace for transmitting a signal generated by the in-plane switch **450**.

The substrate **430** of the keyboard stack-up **400** may be flexible. In other implementations, the substrate **430** is a printed circuit board. One or more stiffening layers (not shown) may also be applied to various parts of the keyboard stack-up **400** such as described above. The keyboard stack-up **400** also includes a dome **470**. The dome **470** may be similar to the dome **380** described above. The dome **470** may be directly coupled, laminated or adhered to the flex or substrate **430**.

The keyboard stack-up **400** does not include a deflection layer as the keyboard stack-up **300** of FIG. **3**A. However, in lieu of a deflection layer, the dome **470** may include a conductive material **460** disposed on a nub **475** or other surface of the dome **470**. In some implementations, the conductive material **460** may be co-molded or otherwise integrated with the dome **470**. In other implementations, the conductive material **460** is surface mounted to the dome **470**. In yet other implementations, the conductive material **460** may be painted, etched or printed on the nub **475** or other surface of the dome **470**. As with the conductive material disclosed above, the conductive material **460** in the present embodiment may be configured to bridge a connection between the contacts of the in-plane switch **450** when the keycap **410** and/or the dome **470** is actuated or collapsed.

FIG. **5** illustrates a cross-section view of an example keyboard assembly **500** according to one or more embodiments of the present disclosure. The cross-section view shown in FIG. **5** may be taken along A-A of FIG. **2** when the keyboard assembly **200** is assembled.

The keyboard assembly **500** may include a top case **510**. The top case **510** may have a first thickness and may further include a keyhole **520** and a support structure **530**. The support structure **530** may have a thickness that is less than the thickness of the top case **510**.

In some embodiments, the support structure **530** may extend from the top case **510** and may also provide structural support for the top case **510**. More specifically, the support structure **530** may extend from the top case **510** and may also extend at least partially into the keyhole **520** to form a ledge. The support structure **530** also defines an opening **540** on a bottom surface of the top case **510**. The support structure **530** also supports the substrate **550** (or flex) and the dome of the keyboard stack-up **560**.

The opening **540** receives a keyboard stack-up **560** which may be placed on or coupled to the ledge of the support structure **530** such that the support structure is underneath substrate of the keyboard stack-up **560**. For example, a respective keyboard stack-up **560** of a keyboard stack-up array (such as the keyboard stack-up array **250** shown in FIG. **2**) may be inserted or otherwise threaded through the opening **540** on a bottom of the top case **510**. Once inserted, a keycap **570** may be coupled to the keyboard stack-up **560** via the keyhole **520** disposed on a top surface of the top case **510**. As such, the support structure **530** provides structural support for the keyboard stack-up **560** and also provides structural support for the keyboard assembly **500**.

For example, the support structure **530** may prevent undesired deflection of the keyboard stack-up **560** during use and/or during manufacture and may also prevent a keycap **570** from plunging under the top case **510** or under the ribs (e.g., ribs **230** of FIG. **2**) of the top case **510**.

As with the other keyboard stack-ups described herein, the keyboard stack-up **560** operates as previously described.

The keyboard stack-up **560**, and more specifically the components of the keyboard stack-up **560** may be sealed (e.g., liquid sealed) to the substrate **550** of the keyboard stack-up **560**. In some embodiments, the keyboard stack-up **560** may also include one or more air pockets or vents on a bottom surface that permit the structure to cool and to evacuate air under the dome when the dome collapses.

Although discussed herein as a keyboard assembly, it is understood that the disclosed embodiments can be used as an input assembly for any depressible input mechanism such as, for example, a button, and may be used in a variety of input devices and/or electronic devices. That is, the keyboard stack-up, and the components of the keyboard stack-up disclosed herein may be utilized or implemented in a variety of input devices for an electronic device including, but not limited to buttons, switches, toggles, wheels, touch screens and so on.

The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the described embodiments. However, it will be apparent to one skilled in the art that the specific details are not required in order to practice the described embodiments. Thus, the foregoing descriptions of the specific embodiments described herein are presented for purposes of illustration and description. They are not targeted to be exhaustive or to limit the embodiments to the precise forms disclosed. It will be apparent to one of ordinary skill in the art that many modifications and variations are possible in view of the above teachings.

What is claimed is:

1. A keyboard assembly comprising:

a top case defining a keyhole within which a ledge extends partially across the keyhole and defines an opening;

a stack-up positioned on a top surface of the ledge and comprising:

a keycap;

a dome positioned below the keycap; and

a switch positioned below the dome; and

a flexible substrate operably coupled to the switch and extending through the opening.

2. The keyboard assembly of claim **1**, further comprising a signal trace formed on the flexible substrate for detecting actuation of the switch.

3. The keyboard assembly of claim **1**, wherein the ledge has a secondary thickness less than a primary thickness of the top case.

4. The keyboard assembly of claim **1**, further comprising a deflection layer positioned between the dome and the switch.

5. The keyboard assembly of claim **1**, wherein the top case is at least partially flexible.

6. The keyboard assembly of claim **1**, further comprising a light source coupled to the flexible substrate.

7. The keyboard assembly of claim **6**, further comprising a power trace formed on the flexible substrate for providing power to the light source.

8. The keyboard assembly of claim **6**, wherein the light source is a light-emitting diode.

9. An input assembly comprising:

a top case defining a keyhole within which a ledge extends partially across the keyhole and defines an opening;

a keycap positioned at least partially in the keyhole;

a hinge mechanism positioned below and coupled to the keycap;

a switch positioned between the keycap and above the ledge;

a substrate extending from within the keyhole through the opening.

10. The input assembly of claim **9**, wherein the hinge mechanism is coupled to the substrate on a first side.

11. The input assembly of claim **10**, wherein the substrate is coupled to the ledge on a second side opposite to the first side.

12. The input assembly of claim **9**, wherein the switch includes a signal trace and a power trace, wherein a signal is sent along the signal trace in response to the movement of the keycap.

13. The input assembly of claim **12**, further comprising:

a light source coupled to the substrate and the power trace.

14. An electronic device comprising:

a casing defining a keyhole;

a support structure extending partially across the keyhole and defining an opening within the keyhole;

an input stackup disposed in the keyhole and comprising:

a keycap;

a switch positioned below the keycap; and

a flexible substrate operably coupled to the switch and extending through the opening.

15. The electronic device of claim **14**, further comprising a deflection layer positioned between the keycap and the switch.

16. The electronic device of claim **14**, wherein switch comprises concentric contacts.

17. The electronic device of claim **14**, wherein the casing has a first thickness and the support structure has a second thickness that is less than the thickness of the casing.

18. The electronic device of claim **14**, further comprising an actuation mechanism configured to bridge contacts of the switch, the actuation mechanism disposed between the keycap and the switch.

19. The electronic device of claim **18**, wherein:

the actuation mechanism comprises conductive material disposed on a surface of the actuation mechanism; and

the conductive material is configured to bridge the contacts of the switch.

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